

IN THE CLAIMS

The claim listing for this divisional application are as follows:

Claims 1-26 (canceled)

27. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to grind~~ grinding an outside diameter of material of a heterogeneous medium to an outside diameter of a finished lens element using a centerless grinder.

28. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to adjust~~ adjusting deflection of an outer circumference of a material of a heterogeneous medium with a pick tester or a microscope; and ~~a step to grind~~ grinding an outside diameter of said material of the heterogeneous medium to an outside diameter of a finished lens element with said material kept fixed to a rotating shaft of a centering machine.

29. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to form~~ forming a curved surface having a desired shape on a material of a heterogeneous medium so that its center is nearly coincident with a center axis of a refractive index distribution; and ~~a step to grind~~ grinding an outer circumference of the material of the heterogeneous medium on which the curved surface has been formed using a bell clamp or a sider type centering machine until the outer circumference has an outside diameter of a finished lens element.

30. (currently amended) A manufacturing method of a lens element of an heterogeneous medium comprising: ~~a step to grind~~ grinding and ~~polish~~ polishing a material of a heterogeneous medium so as to have a planar surface while keeping it in a condition where it is fixed to a jig in a direction perpendicular to a grinding direction.

31. (original) A manufacturing method of a lens element of a heterogeneous medium according to claim 30, wherein said jig to which the material of a heterogeneous medium is to be fixed is a V block or a gear.

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32. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to fix~~ fixing a material of a heterogeneous medium which has an outside diameter larger than that of a lens element of a heterogeneous medium and a curved surface of a desired shape into a hole which has a diameter nearly equal to that of said material of the heterogeneous medium and is formed at a center of a fixture made of a glass, metal, resin or the like material, and ~~grind and polish~~ grinding and polishing said material of the heterogeneous medium together with said fixture so as to form a curved surface of a desired shape.

33. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to fix~~ fixing a material of a heterogeneous medium having a surface which has been ground into a first curved surface of a desired shape to a rotating shaft of a fixture having a curved surface of a shape which is the same as that of a second curved surface reverse to said first curved surface while adjusting deflection of an outer circumference with a pick tester or a microscope; and ~~a step to grind~~ grinding the second curved surface of said material of the heterogeneous medium into a curved surface of a desired shape with a curve generator.

34. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to form~~ forming both ends of a material of a heterogeneous medium into curved surfaces of desired shapes respectively which have centers nearly coincident with a center axis of a refractive index distribution; and ~~a step to center~~ centering the material of the heterogeneous medium on which said curved surfaces are formed by the bell clamp method.

35. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to form~~ forming both ends of a material of a heterogeneous medium into curved surfaces of desired shapes each of which has a center nearly coincident with a center axis of a refractive index distribution; and ~~a step to fix~~ fixing one of the curved surfaces of the material of the heterogeneous medium on which said curved surfaces are formed to a fixture having a curved surface of a shape which is the same as that of the other curved surface and center the material of the heterogeneous

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medium with a sider type centering machine while observing an image reflected by the other curved surface.

36. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to form~~ forming, at both ends of a material of a heterogeneous medium, curved surfaces of desired shapes each of which has a center nearly coincident with a center axis of a refractive index distribution; and ~~a step to center~~ centering the material of the heterogeneous medium on which said curved surfaces are formed with a sider type centering machine.

37. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to grind~~ grinding one surface of a material of a heterogeneous medium into a curved surface of a desired shape using a curve generator while keeping said material in a condition where it is fixed with a collet chuck.

38. (currently amended) A manufacturing method of a lens element of a heterogeneous medium comprising: ~~a step to form~~ forming a surface of a material of a heterogeneous medium into a curved surface of a desired shape which has a center nearly coincident with a center axis of a refractive index distribution; and ~~a step to form~~ forming the other surface into a curved surface of a desired shape using a curve generator while fixing the material of the heterogeneous medium with a collet chuck and supporting said curved surface with a pipe.

39. (original) A manufacturing method of a lens element of a heterogeneous medium according to claim 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37 or 38 wherein a center axis of said material of the heterogeneous medium is coincident with a center axis of its refractive index distribution.

Claims 40-48 (canceled)